

## NOTES, ABSTRACTS, AND REVIEWS.

*Austin Lee McRae, 1861-1922.*

We regret to announce the death of Prof. A. L. McRae, which occurred at Rolla, Mo., March 18, 1922, at the age of 60 years.

Professor McRae will be remembered by the older members of the Weather Bureau as a colleague of McAdie, Morrill, and Schultz in the early eighties in investigations upon atmospheric electricity. While stationed at Boston he studied under Prof. John Trowbridge, of Harvard University, and received the degree S. D. from that institution in 1886. In addition to service at Boston, he was on duty at Columbus, Ohio, Terre Haute, Ind., Rapid City, S. Dak., and Columbia, Mo. At the last-named station he perfected arrangements whereby the State Weather Service of Missouri, organized in 1877 by Prof. F. E. Nipher, of Washington University, and supported by private means, was taken over by the National Weather Service in cooperation with the State Board of Agriculture of Missouri. Professor McRae was the first director under the reorganization. He resigned from the Signal Service in August, 1891, to engage in teaching in the University of Missouri; later he held the chair of professor of physics at the University of Missouri, School of Mines, at Rolla, Mo., 1891-1894. After a brief period of teaching in the University of Texas and three years as consulting engineer in St. Louis, Mo., he returned to the School of Mines at Rolla in 1899 as professor of physics and since 1915 as director. He is survived by a wife and three children.—A. J. H.

#### HEAVY RAINS AT PAGO PAGO HARBOR, TUTUILA, SAMOA.

In the January, 1922, REVIEW, page 26, the monthly amounts of precipitation at Pago Pago Harbor were presented. We have now received through Dr. Alfred G. Mayor, Director Department of Marine Biology of the Carnegie Institution of Washington, additional details as to the frequency and distribution of precipitation of 2 inches and over in 24 hours at the same place. The observations were made at the United States naval station under the direction of Lieut. F. C. Nyland, United States Navy.

Tutuila is the southernmost of the Samoan group and its geographical coordinates are S. lat. 14° 18'; W. long. 170° 41'. The harbor of Pago Pago is a deep indentation on the south coast, which almost bisects the island. The harbor is encompassed by mountains; a sharp peak to the westward reaches an altitude of 2,133 feet above sea level; directly to the eastward another peak rises to an elevation of 1,719 feet.

The average annual precipitation of Pago Pago is 196 inches (21 years' record). The greatest annual amount in that time was 284.4 inches; the least 130.1; the greatest monthly amount was 60.5 inches, in May, 1913; the least, 0.1, in June, 1900. The greatest 24-hour amount was 20 inches, in May, 1912; other large daily amounts were 16.5 inches, in June, 1920, and November, 1908; 15.9 inches, in September, 1914.

These amounts compare very well with other large daily rains in the Tropics. Java, for example, has a record of 20.12 inches in 24 hours at Besokor, a plains station at an elevation of but 45 m. above sea level.

Greater amounts than those mentioned are occasionally recorded in temperate latitudes far removed from the ocean.

*The winds of the Samoan group.*—The southeast trades blow from the middle or end of April to November, diminishing in strength and steadiness during the last half of the winter. In July and August—winter months in the Southern Hemisphere—the southeast trades are fresh and at times squalls prevail. The two months named are the months of least average rainfall, although in some seasons heavy rains fall even then. The winds during the remainder of the year are, in general, easterly. At times, however, westerly winds and calms prevail.

In general, it would seem that the heavy precipitation of Tutuila as compared with Apia, on the north side of Upola, must be due to the topography of the first named and the fact that Pago Pago is practically an inland rather than a coast station.

In the table below will be found the total number of rains of 2 inches and over in 24 hours, arranged by months and groups or classes. The latter range from 2-4.5 inches at the lower end to 15-20 inches at the upper end. It will be seen that 80 per cent of the heavy rains fall within the first class and that 94 per cent of the total number of heavy rains fall within the first and second classes.

TABLE 1.—Number of 24-hour rains of 2 inches and over (1900-1921) at Pago Pago Harbor, Tutuila, Samoa.

Classes.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Annual.
(1) 2-4.5 inches.....	45	60	56	45	30	37	16	21	33	42	47	53	P. a. 80
(2) 4.6-7 inches.....	15	5	7	8	5	5	2	2	7	7	15	5	14
(3) 7.1-9.5 inches.....	3	4	2	2	0	3	1	1	1	1	3	1	3
(4) 9.6-12 inches.....	1	3	1	1	1	1	3	1	1	0	0	0	2
(5) 12-15 inches.....	1	1	1	1	0	1	1	0	0	0	1	1	.....
(6) 15-20 inches.....	1	1	1	1	1	1	1	1	1	1	1	1	.....
Total.....	64	73	65	55	37	47	22	23	43	50	66	60	.....

—A. J. H.

#### CRUISE OF THE "ARNAUER HANSEN."

We are indebted to the American consul at Bergen, Norway, for the information that the Bergen Geophysical Institute is equipping the *Arnauer Hansen*, a motor ship, for a meteorological research cruise in the Atlantic, the main object being to establish the practicability of issuing weather forecasts for the Atlantic.

The *Arnauer Hansen* is being fitted out at Bergen, and its cruise will be financed by the Norwegian Government and Bergen shipping interests. Professor Helland-Hansen, chief of the Bergen Geophysical Institute, and Chief Calwagen, of the Bergen Observatory, will accompany the expedition, which will set out from Ostend early in May.—A. J. H.

#### THE JAN MAYEN METEOROLOGICAL STATION.

Through the courtesy of the American consul at Bergen, Norway, we are able to announce that the meteorological station established on Jan Mayen in the autumn of 1921 will be taken over by the Norwegian Government on May 1, 1922. Jan Mayen is an isolated rock in the Arctic Ocean, nearly midway between North Cape and